Q.1   Which of the following formula correctly describes Rayleigh scattering of light from the gas molecules?
I is the intensity of scattered light and λ is the wavelength of light.
(A)$I \propto \lambda^4$ (B)$I \propto 1/\lambda^2$ (C)$I \propto 1/\lambda^3$ (D)$I \propto 1/\lambda^4$

Q.2   Which of the following statement is correct?
(A)At sunset or sunrise, the sun rays have to pass through a small distance in the atmosphere.
(B)At sunset or sunrise, the sun rays have to pass through a larger distance in the atmosphere.
(C)In Rayleigh scattering, the size of the particle should be comparable to the wavelength of light.
(D)Most of the blue and other shorter wavelengths are not removed by scattering.

Q.3   Frequencies of light incident on a system of scattering particles are in the ratio of $1:2$. Then, the intensities of scattered light in a particular direction are in the ratio:
(A)$1:4$ (B)$1:2$ (C)$1:8$ (D)$1:16$

Q.4   Statement1 : On viewing the clear blue portion of the sky through a Calcite crystal, the intensity of transmitted light varies as the crystal is rotated.
Statement2: The light coming from the sky is polarized due to the scattering of sunlight by particles in the atmosphere. The scattering is the largest for blue light.
(A) Both Statement1 and Statement 2 are true, and the Statement 2 is correct explanation of Statement 1
(B)Both Statement 1 and Statement 2 are true, but Statement 2 is not a correct explanation of Statement 1.
(C)Statement 1 is true and Statement 2 is false
(D)Statement 1 is false and Statement 2 is true.

Q.5   Which of the following is a type of polarization?
(A)Linear Polarization   (B)Circular Polarization
(C)Elliptical Polarization   (D)All of these

Q.6   A linearly polarized light can be obtained from an unpolarized light by which of the following method(s)?
(A)Polarization by Reflection   (B)Polarization by Scattering
(C)Polarization by Refraction   (D)All of the above

Q.7   A ray of light is incident on the surface of a glass plate of refractive index 1.732 at the polarizing angle. The angle of refraction is,
(A)60°   (B)45°   (C)30°   (D)15°

Q.8   A beam of natural light falls on a system of 5 Polaroids, which are arranged in succession such that the pass axis of each Polaroid is turned through 60°with respect to the preceding one. The fraction of the incident light intensity that passes through the
(A)$\frac{1}{64}$ (B)$\frac{1}{32}$ (C)$\frac{1}{512}$ (D)$\frac{1}{128}$

Q.9   A beam of unpolarized light of intensity I_0 is passed through a Polaroid A and then through another Polaroid B which is oriented so that its principal plane makes an angle of 45° relative to that of A. The intensity of the emergent light is,
(A)I_0 (B)$I_0/2$ (C)$I_0/4$ (D)$I_0/8$

Q.10 The critical angle for a certain medium is $\sin^{-1}(3/5)$. The polarizing angle for that medium is,
(A)$\sin^{-1}(4/5)$.   (B)$\sin^{-1}(5/3)$.   (C)$\sin^{-1}(3/4)$.   (D)$\sin^{-1}(4/3)$.

ANSWER KEY

Q.	1	2	3	4	5	6	7	8	9	10
Sol.	(D)	(B)	(D)	(A)	(D)	(D)	(C)	(C)	(C)	(B)